Petr Stepanov

Material Scientist. Nuclear Chemist.

✉ stepanovps@gmail.com   📞 419-496-86-02   🏠 petrstepanov.com   📦 scholar.petrstepanov.com

Objective

Highly motivated PhD student with expertise in gamma spectroscopy, positron annihilation spectroscopy, microscopy and nuclear physics. A strong background in computational techniques, web applications and desktop software development. More than five years in UI and UX design.

Graduating in December 2019. Seeking to either apply a great software development company, join a startup or continue scientific career. Wishing to become an effective member of a research group as a post doctorate fellow or find a steady position in the industry.

Authorized to work in US on Optional Practical Training (OPT) in following areas: physics, chemistry and computer science. Will consider visa sponsorship (H1B) offers.

Education

Bowling Green State University   Aug 2014 → now

Doctor of Philosophy in photochemical sciences.
Dissertation topic: Development of positron annihilation spectroscopy: from experimental setups to advanced processing software.

British Higher School of Art and Design   Dec 2011 → Feb 2012

Intensive: graphical design and visual communications.

National Research Nuclear University   Sep 2004 → Feb 2011

Bachelor and Master of Science in solid state physics.

Thesis topic: Radiation defect studies of nuclear power plant vessel steels by means of positron lifetime annihilation spectroscopy.

Work experience

Freelance UI/UX Designer and Frontend Developer   Aug 2014 → now

Working on branding identity guidelines for number of startups. Designing interactive prototypes and writing agile user stories. Slicing mockups into interactive HTML and CSS with respect to the responsive guidelines. Preparing image and animation assets.

Contributing on the frontend part. Working on gulp and webpack scripts, writing SCSS from scratch. Mostly worked with applications with Node.js, EJS, Mongo.DB and modular JavaScript.

As a part of a team worked on cross-platform mobile applications with Ionic framework.

Research Assistant, Software Developer   Aug 2014 → now

@Bowling Breen State University, Ohio (United States)

Material science research, interaction of ionizing radiation with matter, radiation defects in solids, radiation chemistry. Gamma-spectroscopy. Positron annihilation spectroscopy. Maintaining and tune-up of fast-timing ORTEC electronics. Manufacturing of the radioactive positron sources.

Developing desktop software solutions (C++, ROOT) for acquisition, storing and treatment of raw experimental data and development and verification of theoretical models. Developing websites for research groups and international meetings and conferences.

Web Designer, Frontend Developer   Apr 2011 → Aug 2014

@Gridnine Systems, Moscow, Russia

Prototyping conceptual wireframes and visual mockups for web applications (Photoshop, Illustrator).

Developing frontend part of a number of corporate web applications (Google Web Toolkit, JavaScript, Backbone.js and Require.js). Responsive layout with SASS and LESS. Doing some server-side backend programming (Java).

Computer Science Teacher   Oct 2009 → May 2011

@Phys-Tech College at Moscow Institute of Physics and Technology (MIPT), Moscow, Russia

Provided instruction and guidance to high school students on following computer courses: advanced C++ programming, markup on the web, Photoshop and 3D Studio Max.

Research Scientist   Sep 2008 → Apr 2011

@Institute for Theoretical and Experimental Physics (ITEP), Moscow, Russia

Application of positron lifetime spectroscopy for studying the radioactive-induced defects in steels. Monte-Carlo particle simulations with Fortran 95. Maintaining software for CAMECA tomographic atom probe (MSVC). Application of CERN ROOT libraries for fitting and analysis of experimental spectra.

Featured publications

- Stepanov, P.; Stepanov, S.; Byakov, V.; Selim, F. Developing New Routine for Processing Two-Dimensional Coincidence Doppler Energy Spectra and Evaluation of Electron Subsystem Properties in Metals. *Acta Physica Polonica A* **2017**, *132* (5), 1628–1633 DOI: 10.12693/aphyspola.132.1628.

- Ji, J.; Colosimo, A. M.; Anwand, W.; Boatner, L. A.; Wagner, A.; Stepanov, P. S.; Trinh, T. T.; Liedke, M. O.; Krause-Rehberg, R.; Cowan, T. E.; et al. ZnO Luminescence and scintillation studied via photoexcitation, X-ray excitation and gamma-induced positron spectroscopy. *Scientific Reports* **2016**, *6* (1) DOI: 10.1038/srep31238.

Full list of publications is posted on my Google Scholar page.

Material Research Skills

Characterization facilities

Positron Lifetime and Doppler Broadening Annihilation Spectroscopy (PALS, DBAR). Atom Probe Tomography (ATP). Scanning Electron Microscopy (SEM). Transmission electron microscopy (TEM). Atomic Force Microscopy (AFM). UV-VIS Spectroscopy. Fourier Transform Infrared Spectroscopy (FTIR).

Material processing

High-temperature annealing. Wet chemical etching. Electrical Contact Fabrication. Sample polishing.

Computer Skills

Software

Scientific packages: Wolfram Mathematica, Maple.

Markup: LaTeX, MS Office Suite, Zotero.

Data plotting: OriginLab, Gnuplot, QtiPlot, SciDaVis, Grapher, Adobe Products.

Desktop development

Java and Swing, C/C++ and Qt, GNU Automake, CERN ROOT Framework, PHP, Fortran.

UI/UX design

Figma, Sketch, InVision Studio, Adobe XD, Adobe Photoshop, Adobe Illustrator, Inkscape, Blender.

Frontend

HTML, CSS (LESS and SASS), Bootstrap, responsive web design, JavaScript and jQuery, npm, gulp, GWT, familiar with AngularJS, React.js and Backbone.js. WordPress themes development.

Scientific projects

During my PhD carreer I've developed a number of desktop software for data analysis and spectra interpretation. Scientific library of my choice is [CERN ROOT framework](). It offers numerous packages for histogram manipulation, fitting and plotting as well as data storage and graphical user interface classes.

TLIST Processor

Software is designed to process two-dimensional energy spectra and output one-dimensional coincidence broadened Doppler spectrum. A background fitting and subtraction technique is developed and implemented. [View on GitHub]().

SW Calculator

Program calculates S and W parameters of the 511 keV peak of the annihilation radiation. Software estimates values of the binding electron energies by fitting the CDB spectrum with contributions from e+ annihilation on electrons with different wave functions. [View on GitHub]().

RooPositron

A flexible terminal-based positron lifetime fitting software. GUI is in progress. Software supports deconvolution of lifetime spectra into conventional multiexponential model as well as trapping model. Integration of custom fitting models. [View on GitHub]().

Conferences

18th International Conference on Positron Annihilation (ICPA-18)   Aug 2018

@Orlando, FL, USA

Oral talk "Positions and Ps in Al2O3 Nanopowders".

International Workshop on Physics with Positrons (JPos17)   Sept 2017

@Jefferson Lab, Newport News, VA, USA

Poster "A routine of background subtraction from two-dimensional Doppler broadened spectra".

12th International Workshop on Positron and Positronium Chemistry (PPC12)   Sept 2017

@Maria Curie-Sklodowska University, Lublin, Poland

Poster "Developing new routine for processing two-dimensional coincidence Doppler energy spectra".

Ohio Photochemical Society Meeting (Oops)   May 2017

@Maumee Bay Lodge & Conference Center, Maumee, OH, USA

Poster "Developing new routine for background subtraction in two-dimensional coincidence Doppler broadening spectroscopy".

58th Electronic Materials Conference (EMC)   Jun 2016

@University of Delaware, Newark, DE, USA

Oral talk "High-Sensitivity Measurements of Defects in ZnO by Means of Digital Coincidence Doppler Broadening of Positron Annihilation Spectroscopy".

Annual Spring Meeting of the APS Ohio-Region   Apr 2016

@University of Delaware, Newark, DE, USA

Oral talk "Identification of chemical environment of defects in ZnO by means of digital coincidence Doppler broadening of positron annihilation radiation".

Ohio Inorganic Weekend   Nov 2015

@Bowling Green State University, OH, USA

Poster "Approaching Structural Defect Characterization and their Chemical Identification by Means of Coincidence Doppler Broadening of Annihilation Radiation"

41st Polish Seminar on Positron Annihilation (PSPA-13)   Sep 2013

@Maria Curie-Sklodowska University, Lublin, Poland

Oral talk "Application of positron spectroscopy for detection of nanostructures in alcohol—aqueous mixtures".

Scientific associations

American Physical Society (since 2016)

The Ohio Academy of Science (since 2016)

Professional networks

- Check out my [portfolio on Dribbble](#).
- Look up some of my [code on GitHub](#).
- Find my professional contacts [on Linkedin](#).
- Get familiar with my [scientific career on ResearchGate](#).
- Skim through list of my [publications on Google Scholar](#).

Interests

Snowboarding, rollerblading, hiking, working on cars and bikes, footbag.